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A new system of teeth

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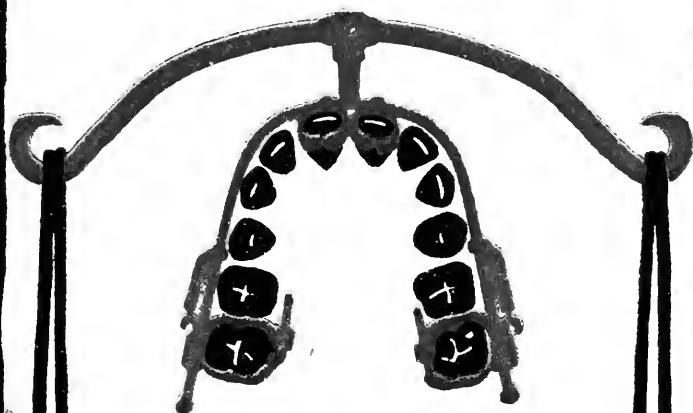
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he

Knapp System

of

Teeth Regulation



for

Major Protrusion.

THE COURSE.

What it is. What it will do. What it will cost.

- It will treat the subject of Orthodontia on an entirely new plan.
- Its object will be to make success as certain and as easily attained in teeth regulation as in the other dental operations.
- It will enable you to determine exactly what is best to be done with a case without aid from any other source.
- It will be up to date in every respect.
- It will be profusely illustrated and will be printed on good paper.
- It will extend over a period of from six months to one year, and will be delivered as each volume is printed, (from four to six volumes).
- It will show how to save money on appliances.
- It is the result of twelve years work and the expenditure of over \$10,000.
- It will cost you only \$25.
- It will show you how to make back the whole cost of the course from two or three simple cases at \$10 or \$15 each.
- It will enable any practitioner to add several hundred dollars a year to his income while consuming very little of his time.
- It will benefit your patients.

A New System *of* **Teeth Regulation**

*with finely made original
devices
ready for immediate operative
application*

Without Soldering

By
Miland A. Knapp, D.D.S.
Minneapolis, Minnesota



The S. S. White Dental Manufacturing Co.
Sole Agent.
Philadelphia, Pa., U. S. A.

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MAJOR PROTRUSION.

There is probably no dental irregularity that can be so well classed by itself and treated in exactly the same manner and with the same appliance in every instance as protrusion of the superior incisor teeth, and there is probably no other one class of dental irregularity met with so frequently as this deformity. The causes which produce this condition are of practical interest to us only as their determination helps us



Fig. 1.

to prevent the condition or to more easily correct and retain the teeth after being moved, so that the recurrence of the condition from mechanical or other means will be more surely prevented.

There are three general classes of protrusion of the superior incisor teeth. In the first class, cases in which both arches are normal in width, the lower incisors forming a perfect arch and giving proper prominence to the lower lip and chin, with an

abnormal development of the superior maxillary bones and the teeth larger and wider than they should be to correspond to the size of the lower, forming an unduly prominent upper jaw with, in some cases, an inability to cover the upper teeth with the lip without great effort. In the case shown in Fig. 1 it was impossible for the patient to cover the superior incisor teeth with the upper lip, and when by effort the mouth was closed so that the lips were in contact the lower lip was

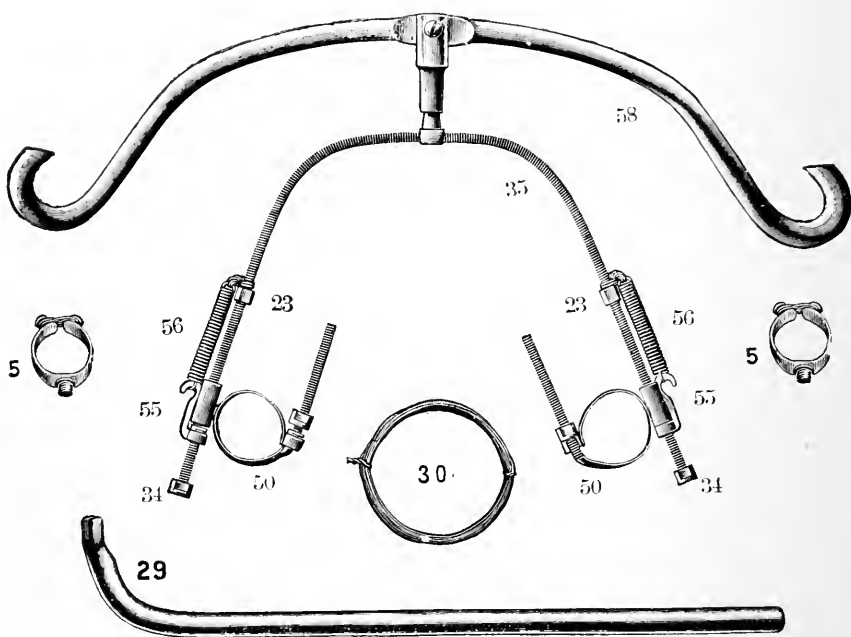


Fig. 2.

raised to cover the upper teeth. In the second class are those cases in which the lower teeth form a symmetrical arch of normal prominence, the upper teeth protrude as in the first class, but the arch is very much narrower with the bicusps and molars striking inside the buccal cusps

of the lower teeth. In the third class the conditions are such that the upper teeth have undue prominence, while the upper arch may be either normal or narrow, and with the lower jaw receding, thereby causing a receding lip and chin which gives to the face an expression of inferior mental capacity. The great majority of cases are those of the first class.

After experimenting with and using in practical work all the appliances described by writers on this subject, and carefully taking note of all the difficulties encountered in their use, both in the construction of the appliance and the peculiarities of each case, I have endeavored to construct an appliance

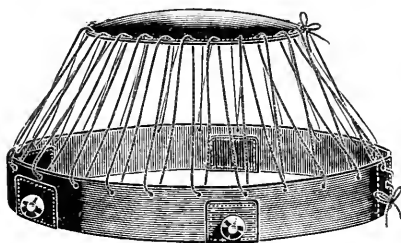


Fig. 3.

which would overcome to the greatest possible extent their defects, and one that would be invariably applicable to ALL THESE CASES. Some of the requirements of an appliance for this work may be enumerated as follows: it should be so constructed that it may be immediately adapted to all cases without the necessity of soldering bands to fit each size of tooth; these bands should be so constructed that they can be cemented to the teeth and the appliance removed from the mouth at any time and replaced without removing any of the bands; the appliance should take up as little room as possible and should be made entirely of metal; all

the force required to retract the teeth should be gained from occipital anchorage, and this, of course, must be obtained by means of a head-cap; the appliance should be so constructed that it will automatically retain the teeth at any time when the head-cap is removed, as it is very necessary to the comfort and ease of the patient that the head-cap be not worn while attending school or when appearing in public; this should also be so constructed that it can be removed or replaced instantly by the patient, and yet be held securely in position

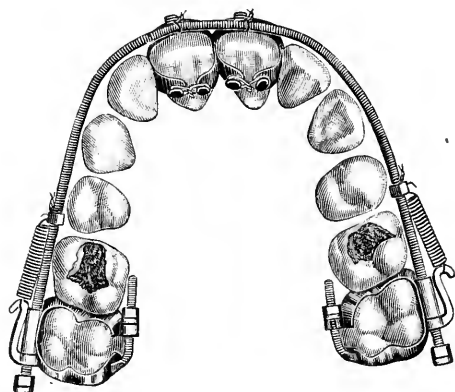


Fig. 4.

while the pressure is applied to the teeth. The appliance which I have found to most completely meet these requirements is shown in Figs. 2 and 3. This appliance (with the exception of the head-cap No. 60 and protrusion-bow No. 58) is constructed entirely from the regular parts of my appliances used in all classes of irregularities. The parts used in this appliance are double-socket screw bands No. 50, button bands No. 5, arch bar No. 35, lock nuts No. 23, bar end caps No. 34, bar hooks No. 55, springs No. 56 and protrusion bow No. 58. Where the molar teeth are abnormally small No. 49

bands are used in place of No. 50, and where they are larger than the average size molar No. 51 or 52 may be used. In cases where the incisors are abnormally small the No. 4 band may be used instead of No. 5 for attaching to the anterior teeth—central incisors preferred.

Figure 4 shows the application of this appliance, the detail of which I most frequently use, but a number of minor modifications may be made to meet any peculiarities arising in any individual case, or to suit the particular purposes of the

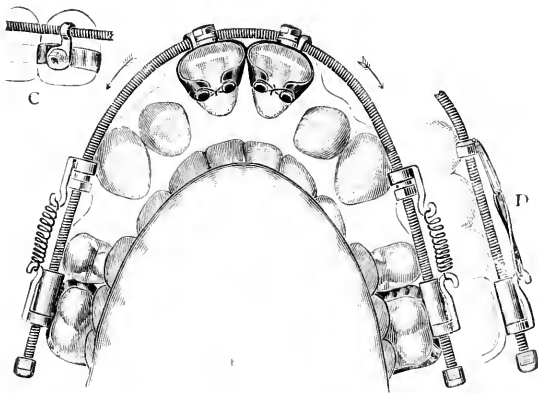


Fig. 5.

operator. In this instance (Fig. 4) the bands which are placed on the central incisor teeth (they may be placed on the laterals or on all four teeth if necessary) have their studs on the labial surfaces of the teeth. The arch bar No. 35 is bent to conform to the shape of the arch, or to the shape of the desired arch, as the teeth in moving back will conform to the shape of this bar, and the required form of the arch in completing the case can be determined while the case is under treatment. In Fig. 4 the bar is wired to the studs with band wire No. 30. The bar may be above or below the studs, or it

may be attached to the stud by bending a piece of retaining clamp No. 39 as shown at c, Fig. 5. This hook is secured to the stud of the band by retaining clamp nut No. 38, and by using this easily constructed device the bar can be held firmly at the gum line or at any other position on the tooth without moving the bands.

Another method of keeping the arch bar at the desired

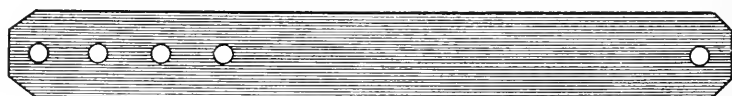


Fig. 6.

position on the tooth is shown in Fig. 7. This is formed by making a band of 36 gauge 22 caret gold, pinching the ends together on the labial surface of the tooth, and soldering. Then by cutting transverse grooves with a Fissure burr in two or three different places (shown in Fig. 8) to receive the arch bar, this bar may be placed near the gum, or near the cutting edge as the operation may require. It will be readily understood that when the arch bar presses against the tip, or



Fig. 7.

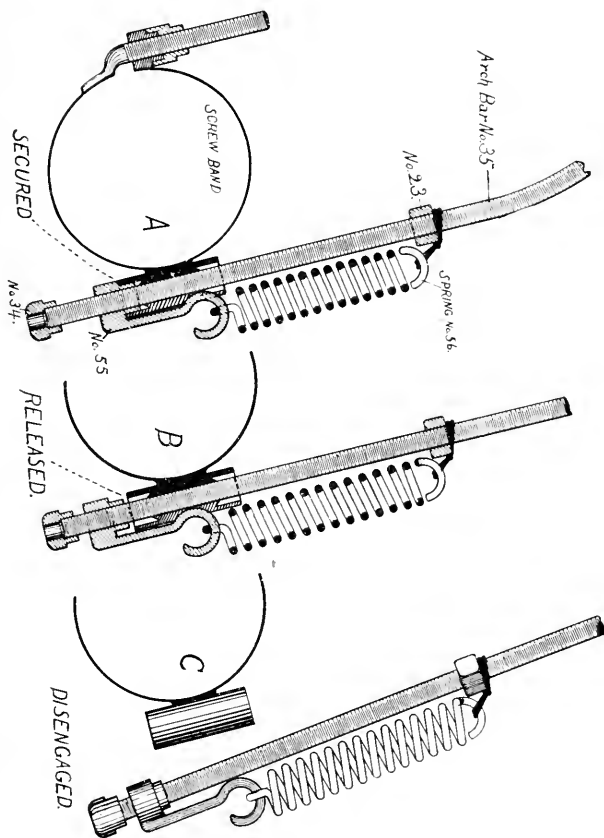


Fig. 8.

cutting edge of the tooth, that part of the tooth will be retracted more rapidly than the apex of the root, which is very desirable in a case like the one shown in Fig. 9. If, however, the bar is placed at the gum



line (Fig. 10) the whole tooth will be retracted, the apex of the root moving practically as fast as the crown of the tooth. It will be found that when nicks are cut in the band, as shown in Fig. 8, there will be no necessity for wiring the arch



bar to the band, and by simply slipping the hooks out of the posterior ends of the clutch tubes the bar can be immediately removed. The screw bands should be placed on the molar teeth with their clutch tubes on the buccal side of the teeth.

The arch bar should be placed in position and worn one or two days, when it is well to loosen the screw bands and cement them to the teeth as these appliances generally remain in the mouth some time, and this precludes the possibility of decay commencing under the band.

The arch bar, after being bent to the proper shape, should be shortened by cutting off the distal ends so that they project only far enough to allow the bar hook No. 55 to be pressed back one-sixteenth of an inch to disengage it, and should be placed in position as shown in Fig. 4. The springs No. 56 are attached to the bar hook and wired to the arch bar just above the lock nut No. 23. The tension of the springs can be regulated by turning this lock nut forward



Fig. 9.

or backward on the bar, and the pressure of the wire as it draws over the squared surface of the lock nut, prevents the nut revolving on the bar and changing the tension while the appliance is in the mouth. It is necessary to move the lock nut forward a little from time to time, as the case progresses and the teeth are retracted; also the distal ends of the arch bar will have to be cut shorter if they cause irritation of the cheeks as the length increases back of the clutch tubes. As

will be noticed the arch bar will come into contact with the bicuspid teeth on both sides as the case progresses. This is due to the fact that the anterior portion of the arch is narrower than the posterior, and the arch bar, since bent to conform to the original size of the arch, as it moves back will press against the bicuspid teeth and should be taken off occasionally and widened a little at this point so that it will be free to move forward or backward through the clutch tube without pressing against the buccal surfaces of the teeth.

There are several ways of attaching this appliance to the arch bar, one of which is shown in Fig. 11. Here four bar-hooks are used which do away with wiring or tying the anterior springs to the bar but are a little more bulky than the method shown in Fig. 4. At D, Fig. 5, is shown the

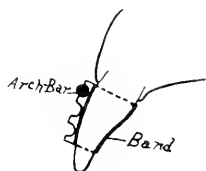


Fig. 10

manner of using a rubber connection. This, however, has all the disadvantages embodied in the use of rubber bands, i. e., the tension diminishes rapidly as the rubber is worn, a result most undesirable. The springs will retain their tension for any length of time, and the tension will become less only as the arch bar moves back. When a rubber is used it is necessary to see the patient at least every other day, but with the springs it is seldom necessary to touch them oftener than once in three weeks or longer. The clutch tubes should be so placed that the arch bar when properly bent will pass freely through the tubes, only sufficient tension being given to the springs to draw the bar back against the front teeth when

it is pulled forward a little to test the strength of the springs. It is important that the springs be not too tight as, if they are, the anchor teeth are liable to be moved. If the spring tension is carefully regulated the most extreme cases of protrusion can be corrected with no movement of the molar teeth.

The protrusion bow No. 58 used with this set is shown in Fig. 12. This has a pivoted central standard A, in the socket of which the split chuck B is conically seated. This chuck is transversely bored and threaded to receive the arch bar No. 35.

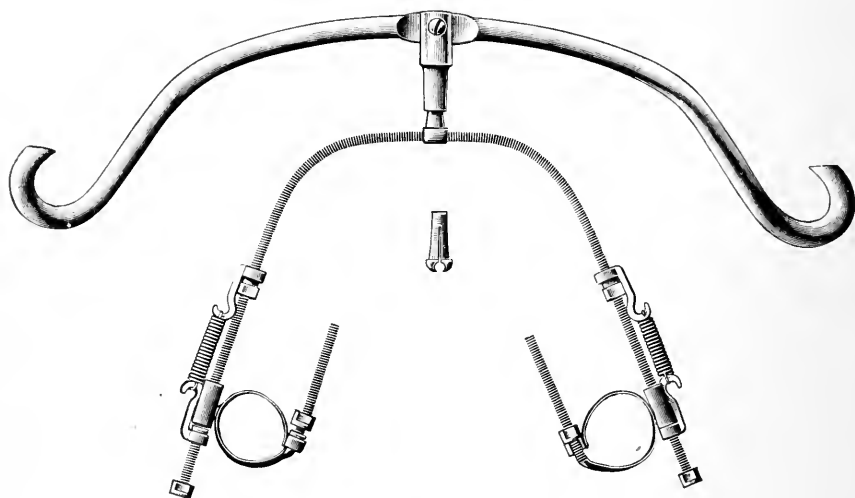


Fig. 11.

In operation the arch bar is secured upon the teeth as described above, the chuck B is then snapped onto the arch bar and the standard A telescoped upon the chuck, (see Fig. 11) which by cone action is made to grip the arch bar at any anterior location—usually a central position. The protrusion bow rocks on its pivot to prevent shocks when the bow ends are pressed upon by the pillow or otherwise, and also pro-

vides for unswerving pressure on the standard, which would act latero-obliquely if it were rocked instead of being rigidly gripped to the bar by the threaded chuck B, Fig. 12. This split chuck grips the bar firmly under retractive pressure which when relaxed somewhat does not detach the bow, but permits adjustive rotation and fixation of the chuck on the bar to direct the retractive force upward and counteract the usual extension of the centrals and laterals simultaneously with the protrusive correction. It also provides for downward pressure to increase the extension if the teeth are to be lengthened while being pressed backward,—a combined movement provided for and sometimes required. A sectional

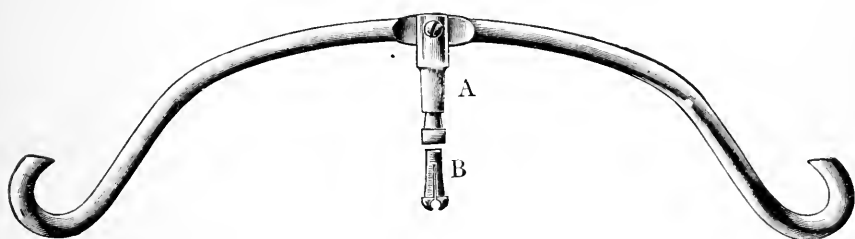


Fig. 12.

detail drawing of the chuck and standard of No. 58 is shown in Fig. 13.

To the curved ends of the protrusion bow are attached elastic rubber bands which connect it to the buttons of the head cap No. 60. (see Fig. 14) The size and strength of these bands can be regulated to suit the case, a young patient requiring much lighter bands than an older one. The lengths of these rubbers will have to be determined in each case. The upper rubbers are always shorter than the lower and by regulating the tension the teeth may be drawn directly back, shortened, or elongated. If both upper and lower rubbers have the same tension the teeth will be drawn straight back;

if the upper rubbers have a greater tension than the lower the anterior teeth will be shortened; and the reverse will be the case when the lower rubbers exert the greater pressure. When it is desirable to shorten the teeth very considerably it is better to band both centrals and laterals as, otherwise, the banded teeth will be shortened while the others will remain their original length.

To remove the bow or change the position it is only necessary to detach the bow ends from the head cap and slip the standard from the chuck. The chuck is readily

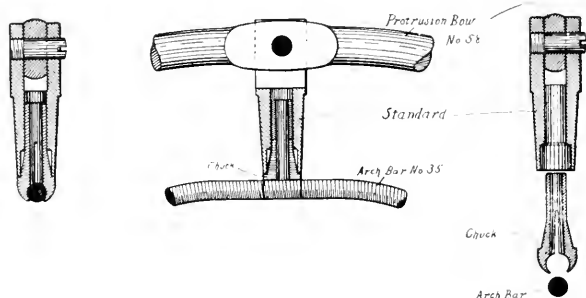


Fig. 13.

sprung off the bar by a slight lateral movement. To connect the head cap with the protrusion bow, cut one end of each rubber to form straight pieces, and with a rubber-dam punch make a hole one-half inch from one end of each piece. Place these over the buttons of the cap, the shorter rubbers over the buttons nearest the lacing. Then place the protrusion bow on the chuck and punch holes in the other end of each of the rubbers at a point corresponding to the ends of the bow. Also punch three or four holes above these, three-eighths to one-half inch apart, and the tension exerted by these rubbers can be regulated by placing the curved hook of the protrusion bow through the proper holes in the rubber.

The head cap (see Fig. 3) is made of kangaroo leather and silk cord, and is light, cool, and adjustable in all directions. It has metal buttons in the proper positions for the attachment of the rubber bands. The cap band is connected at its anterior portion by silk lacing, and the size of the cap may be changed by taking up or letting out this lacing.



The purpose of this pamphlet is to show the construction and operation of the parts included in the Protrusion Set, B, the following cuts being inserted to show some applications of the arch-bar. The parts here described, as well as all the other devices employed in this system, possess the following advantages:

ADVANTAGES OF THE SYSTEM.

First: They are ready to take out of the box and apply to the teeth. No heating or soldering is required. They are therefore as neat in appearance in the mouth as when removed from the box.

Second: The several members are as small as is consistent with strength, they are well plated to resist tarnishing, are accessible in all situations, and are not liable to displacement or loss by the patient.

Third: All the parts are interchangeable, and when an extra member is ordered for a special case, it will work with all the parts on hand as well as those afterward obtained.

Fourth: The directions of force can be changed in a few moments at any time to overcome unlooked-for requirements, or an entirely different device may be put on without the usual trouble of removing bands and soldering on new attachments.

Fifth: The threaded bars having nuts screwed on ready for action can be readily placed in, or be taken from the socket clutch bands while these are fixed on the teeth; whereas, in other systems, the nuts must first be unscrewed, the bar ends be pushed through the band tubes, beyond which the nuts must be again screwed onto the bar ends. This is a very tedious and troublesome operation when those bar ends extend beyond the band tubes on second molars.

Sixth: The several devices can be used over and over again, and will last as long as some instruments commonly used in dental practice.

Seventh: They are time-savers for the practitioner, and are attractive to the patient.

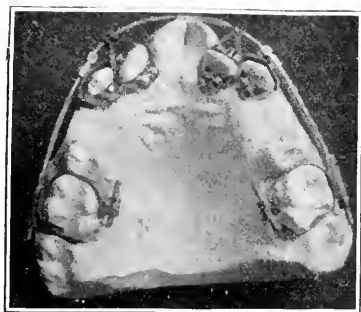
Eighth: The members of each organization are readily separable for sterilization in hot water before replacement in the box.

Ninth: Every member has its indicative number by which it may be identified in description and illustration, and be specified in purchasing orders, to be sure of obtaining the desired part or parts so numbered.

Tenth: The prices of the parts are moderate in view of their convenience, accuracy, uniformity, sightliness, ready usefulness and durability.

Some of the parts are too small for clear delineation, and therefore associated and magnified or sectional views are given, to make obvious the constructive details or assemblages of the several devices.

To those who have hitherto employed thicker and heavier appliances, these thin and small devices may seem inadequate; but the author has in practice proved their sufficiency, and has a firm confidence in their general efficiency when employed with due regard to the correct principles involved in their construction and uses.



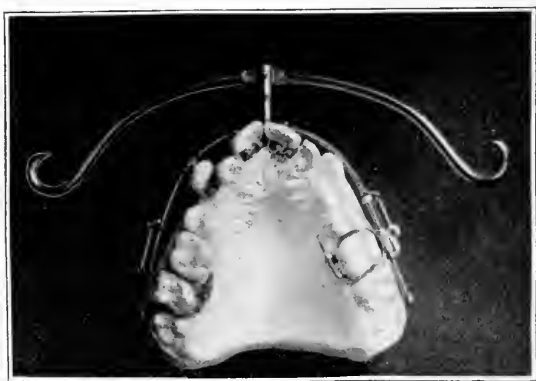
FUNDAMENTAL PRINCIPLES.

A fundamental feature of the system and means is the production of a from time to time progressive movement of the tooth or teeth in the desired direction WITHOUT RETROGRESSION. A comparatively weak initial and successive push or pull action will in every suitable case be effective if the GAIN BE UNFLINCHINGLY MAINTAINED; and this is the function of the clutch nut and lock nut members. A moderate moving force, the locking of the moving mechanism, and a timely repetition of that process results in a new tooth-position and a new restoration to sustain it: these are the sources of success in teeth regulation.

TO CLEAN THE APPLIANCES

AFTER HAVING BECOME DISCOLORED BY USE.

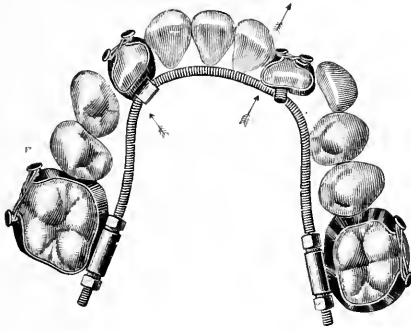
The appliances are as heavily gold plated as is practical without interfering with the proper working of the nuts on the threaded screws, as the gold is deposited most rapidly at the highest part of the thread, making it difficult to turn the nuts on the bars. In the manufacture of the parts allowance



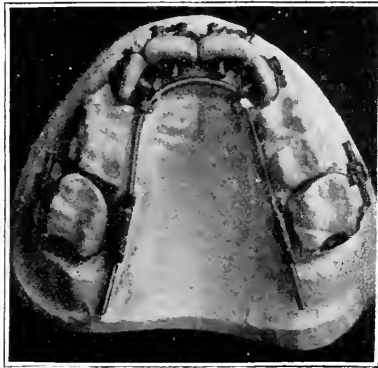
is made for the plating, but there is a limit to the amount of gold that can be put on mechanical devices, particularly where they are threaded and where accurately interchangeable parts are necessary.

The devices will discolor much more rapidly in some mouths than in others, due, to a great extent, to the condition of the

mouth. I have noticed that mouths which contain many amalgam fillings will discolor the appliances much more than mouths with only one or two good sound fillings. The



quality of the amalgam used has also a great deal to do with this. It is evidently a deposit of silver, copper and mercury on the appliances and not corrosion, as 18 caret gold will



discolor as quickly, and, as is well known, pure gold fillings turn black in some mouths. - This, of course, is due to a deposit on the gold, probably from amalgam fillings. In some

months the appliances will remain bright for months, and if the patient cleans the teeth and appliances twice every day, with a medium stiff brush and a good tooth powder, the discoloration will be prevented to a great extent.

Separate the parts and string them on small copper wire before placing them in the cleaning solutions. It is better to



use a separate piece of wire for each part, as some parts may require to be dipped more than once in solution No. 2.

Solution 1.

Concentrated Lye, (Lewis) 1 oz.
Water, 4 oz.
or a little more than will
dissolve.

Solution 2.

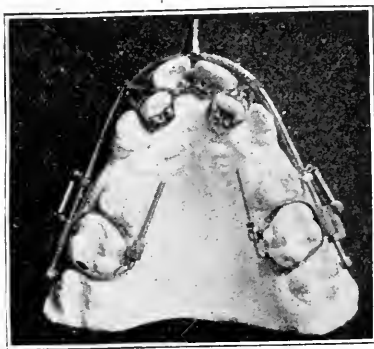
Cyanide of Potassium, $\frac{1}{4}$ oz.
Water, 4 oz.
(see note)

Solution 1 should be kept in a porcelain dish (covered) so that it may be heated over the gas stove. Solution 2 should be placed in a wide-mouth, glass-stoppered bottle and labelled "Cyanide Solution. POISON."

To keep the appliances in good condition the two solutions should be kept on hand, and as soon as removed from the mouth the parts should be put into the solution of lye, (No. 1.) It will do no harm if they remain in this solution a number

of hours, or even days, but if they are to be removed directly they should be boiled in the solution for five or ten minutes; this removes all grease and animal matter and much of the silver, copper, and mercury deposit which is held mechanically. The parts, when removed from the solution, should be rinsed in water and brushed with a nail brush. No pumice nor other substance should be used as it will ruin the plating.

The parts should then be dipped in the cyanide solution, (No. 2) and removed IMMEDIATELY. If they remain in the solution more than ONE SECOND the gold will be dissolved.



They should then be brushed with a nail brush, using soap and water, and if the discoloration has not been entirely removed they can be again dipped in the cyanide, or, better, only the discolored portion immersed. The appliances must then be placed in water and boiled, with two or three changes of water, to thoroughly remove the cyanide; then dried and put away for future use. If dried rapidly the color will be better than if dried slowly. This may be done either by dipping them in alcohol while they are still hot from the boiling water and holding them over a hot stove, or by

placing them, immediately upon removal from the water, in box-wood sawdust which absorbs all moisture and leaves the appliances bright. This last named method is the better.
























NOTE.

As Cyanide of Potassium is a violent poison great care should be taken to thoroughly wash the parts after using it, and special pains taken to cleanse the inside of the long right and left nut and similar parts.



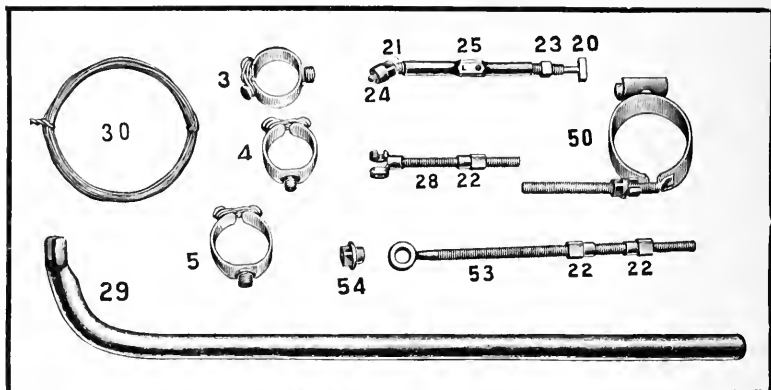
COMPLETE LIST OF NUMBERED APPLIANCES WITH PRICES.

Patented Jan. 18, 1898, Jan. 24, 1898, Sept. 12, 1899, Dec. 25, 1900.

Button Bands, Studded, Nos. 1 to 6, inclusive, each		50 cents.
“ “ Double Socket Clutch, Nos. 7 to 10, each		75 cents.
“ “ Single “ “ “ 11 to 14, each		60 cents.
Bite Bands, Nos. 15 to 18, each		50 cents.
Screw Bands, Studded, Nos. 41 to 44, each		\$1.00.
“ “ Single Socket Clutch, Nos. 45 to 48, each		\$1.00.
“ “ Double “ “ Nos. 49 to 52, each		\$1.00.
Long T Bar, No. 19,		50 cents.
Short T Bar, No. 20,		45 cents.
Ball Bar, No. 21,		50 cents.
Long Right and Left Nut, No. 25,		75 cents.
Short “ “ “ “ “ 26,		60 cents.
Round T Socket Clutch Bar and nut, No. 28,		\$1.00.
Single Auxiliary T Socket, No. 31,		75 cents.
Double “ “ “ “ “ 32,		\$1.00.
Straight Neck Ball Bar, No. 33,		50 cents.
Retaining Clamp, No. 37,		50 cents.
Retaining and Connecting Band, No. 39,		25 cents.
Left-hand Threaded T Bar, No. 40,		50 cents.
Arch-bar, Threaded, No. 35,		\$1.00.
Stud Bar, No. 53,		50 cents.
Right-hand Threaded Ball-bar, No. 57,		50 cents.
Protrusion Bow with Chuck, No. 58,		\$2.50.
Extra Chucks, each		75 cents.
Detachable Stud No. 59,		75 cents.
Head Cap No. 60,		\$2.00.
Clutch Nut No. 22,		25 cents.
Lock Nut No. 23,		20 cents.
Ball Cap No. 24,		75 cents.
Bar-End Cap No. 34,		25 cents.
Band Wire Coil No. 30,		25 cents.
Wrench No. 29,		15 cents.
Perforated Stud No. 36,		25 cents.
Retaining clamp nut No. 38		25 cts.
Stud Bar Nut No. 54,		75 cents.
Bar Hook No. 55,		25 cents.
Springs No. 56, pair,		25 cts.

THE S. S. WHITE DENTAL MFG. CO., SOLE AGENT.

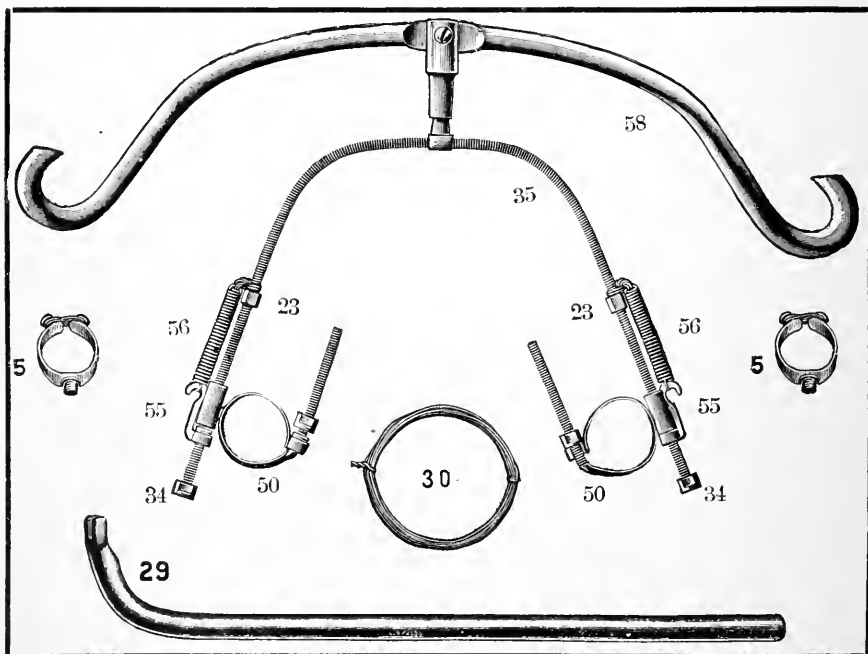
SELECTED SET A, IN BOX.



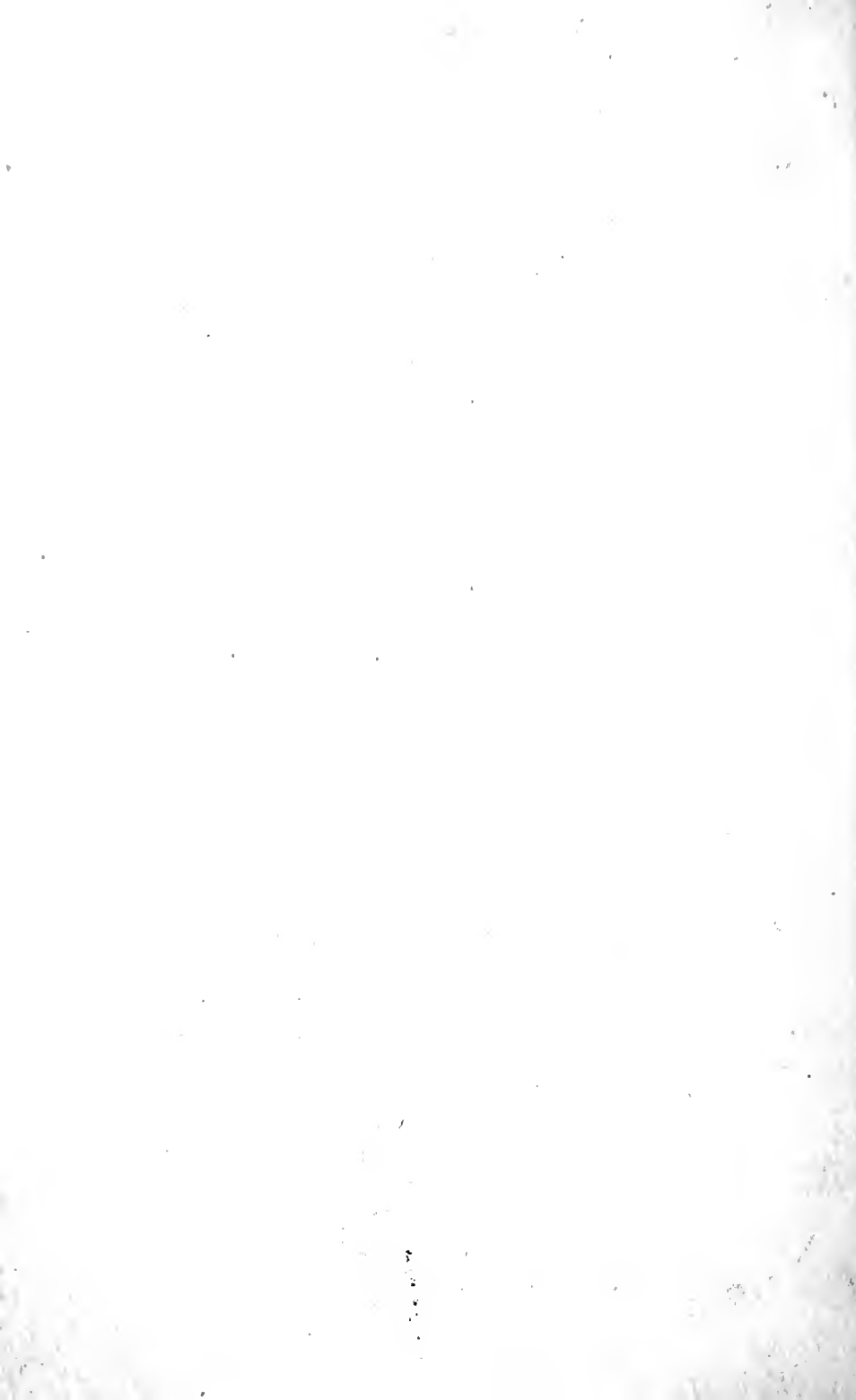
The parts selected for this set will be found sufficient in many cases. A paper-covered copy of Dr. Knapp's Descriptive Book supplied free with each set. Price of book 50 cents.

Price set A.....\$8.00.

PROTRUSION SET B, IN BOX.



Price set B.....\$8.00.



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